Paper No. 16

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

_____

Ex parte WILFRIED KRONE-SCHMIDT

_____

Appeal No. 95-0339
Application 07/881,941[1]

_____

ON BRIEF

_____

Before CALVERT, JERRY SMITH and OWENS, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal from the examiner's rejection of claims 1-15, which are all of the claims in the application. Claims 1 and 9 are illustrative and are appended to this decision.

[1] Application for patent filed May 12, 1992.

THE REFERENCES

Pujado et al. (Pujado)	4,568,447	Feb. 4, 1986
Burgess, Jr. et al. (Burgess)	5,082,629	Jan. 21, 1992
Jackson et al. (Jackson)	5,213,619	May 25, 1993 (filed Nov. 30, 1989)

THE REJECTION

Claims 1-15 stand rejected under 35 U.S.C. § 103 as being unpatentable over Jackson in view of Burgess and Pujado.

OPINION

We have carefully considered all of the arguments advanced by appellant and the examiner and agree with appellant that the aforementioned rejection is not well founded. Accordingly, this rejection will be reversed.

Appellant's claimed invention is an apparatus and method for detecting the presence of contaminants in a supercritical fluid.

The apparatus includes a processing vessel which contains a supercritical fluid, a means for removing a sample stream of the supercritical fluid from the processing vessel and introducing the sample stream into a vessel having a contaminant measurement zone, a pressure releasing means for maintaining the pressure within the measurement zone at or below that required to convert the sample stream into a gas wherein contaminants in the sample

stream remain in non-gaseous form, an attenuated total reflectance plate which has an electromagnetic radiation inlet and outlet and which has an exterior surface, on which the non-gaseous contaminants deposit, located in the measurement zone, a means for introducing into the inlet electromagnetic radiation which remains within the plate but interacts with the contaminants present on the plate to produce altered electromagnetic radiation which exits the plate through the outlet, and means for detecting the altered electromagnetic radiation at the outlet to provide real-time detection of the contaminants in the supercritical fluid.

The method includes the steps of removing a sample stream from a processing vessel which contains a supercritical fluid, introducing the sample stream into a contaminant measurement zone, maintaining the pressure in the measurement zone at or below that required to convert the sample stream into a gas wherein contaminants in the sample stream remain in non-gaseous form, and using an attenuated total reflectance plate to detect the presence of the non-gaseous contaminants deposited on the exterior surface of the plate, thereby providing real-time detection of the contaminants present in the supercritical fluid.

Jackson discloses a process for cleaning, sterilizing and preserving materials wherein the materials are exposed to a dense fluid which is "a gas or a mixture of gases compressed to a supercritical, liquified, or multi-phased states to achieve liquid-like densities" (col. 2, line 65 - col. 3, line 7; col. 4, lines 1-19). Jackson teaches that in-line, real-time chemical analysis instrumentation techniques such as supercritical fluid gas chromatography may be used to examine dense fluid extracts from the cleaning chamber as an indicator of the cleanliness of the material being cleaned (col. 11, line 68 - col. 12, line 4; col. 16, lines 11-16).

Burgess discloses, in one embodiment, an integrated spectrometer for the continuous chemical analysis of liquid, gas, solid or mixed phases in a reaction volume (col. 4, lines 2-8; col. 5, lines 1-3). The spectrometer includes a waveguide into which multi-wavelength electromagnetic radiation is introduced through an entrance grating (col. 4, lines 17-20). The electromagnetic radiation propagates through the waveguide, which has one surface in contact with the reaction volume, and exits through an outlet grating to an electromagnetic radiation sensing device (col. 4, lines 20-34). Each time a propagated beam of electromagnetic radiation bounces off the surface of the

waveguide in contact with the reaction volume, some of the power of the radiation is coupled into the reaction volume and absorbed by the analyte or analytes in the reaction volume (col. 4, lines 31-37). The absorption is based on the absorption characteristics of the analyte or analytes at each wavelength of electromagnetic radiation (col. 4, lines 37-39). According to the principle of attenuated total internal reflectance, the interactions of the propagated light are integrated along the length of the waveguide to produce an absorption spectra of the analyte or analytes in the reaction volume that is similar to a standard transmission spectrum (col. 4, lines 39-44). The intensity loss of a particular wavelength or mode of light is directly correlated to the concentration of analyte or analytes in the reaction volume (col. 9, lines 21-24).

Pujado discloses a process for removing trace quantities of hydrocarbonaceous compounds from an aqueous stream by contacting the stream with a supercritical solvent which dissolves hydrocarbonaceous compounds from the stream, separating the hydrocarbonaceous compounds from the solvent at subcritical conditions, and recovering the hydrocarbonaceous compounds (col. 2, lines 17-30).

The examiner argues that it would have been obvious to one of ordinary skill in the art to use the Burgess analysis method for Jackson's analysis because the Burgess method can be used to measure entrained species in a fluid carrier, which is the aim of Jackson's chemical analyzer (answer, page 4).

Appellant argues that supercritical fluids are not ordinary fluids that one of ordinary skill in the art would include within the phrase "liquids, gases, solids, or mixtures thereof" used by Burgess (col. 4, lines 6-7), and that such a person therefore would not have been led to use his sensor in the Jackson system (brief, page 3).

We are not persuaded by appellant's argument because, first, it is merely unsupported argument by appellant's counsel, and such an argument cannot take the place of evidence. *See In re De Blauwe*, 736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984); *In re Payne*, 606 F.2d 303, 315, 203 USPQ 245, 256 (CCPA 1979); *In re Greenfield*, 571 F.2d 1185, 1189, 197 USPQ 227, 230 (CCPA 1978); *In re Pearson*, 494 F.2d 1399, 1405, 181 USPQ 641, 646 (CCPA 1974). Second, it appears that because a supercritical fluid has no distinguishable gas or liquid phase, one of ordinary skill in the art, given the teaching by Burgess that the method

is applicable to liquids, gases and mixtures thereof (col. 4, lines 6-8), would have had a reasonable expectation that the method would be applicable to a supercritical fluid.

Regarding appellant's claim requirement of a means or step for maintaining the pressure in the measurement zone at or below that required to convert the sample stream into a gas while the contaminants remain in non-gaseous form and are deposited on an attenuated total reflectance plate, the examiner argues that "as Pujado et al discloses separating the contaminant from the supercritical fluid carrier by pressure release, one would have found it obvious to obtain the contaminant in the manner taught by Pujado et al., thereby isolating the contaminant from the fluid" (answer, page 5).

We do not find this argument to be convincing because the examiner has provided no explanation, and it is not apparent to us, why Pujado's teaching of removing contaminants from an aqueous stream by dissolving them into a supercritical solvent and then removing the contaminants from the solvent at sub-critical conditions, would have motivated one of ordinary skill in the art to separate the contaminants from a supercritical fluid when detecting contaminants in a sample of that fluid by

use of an attenuated total reflectance plate. Moreover, it appears that the teaching by Burgess that "prolonged contact with a reaction volume may foul the first surface of the waveguide [i.e., attenuated total reflectance plate] and seriously impair the usefulness of the spectroscopic device" (col. 13, lines 48-51) would have discouraged one of ordinary skill in the art from providing and using a means for separating contaminants from a supercritical fluid and depositing them on an attenuated total reflectance plate as required by appellant's claims.

The examiner argues that "Pujado et al employs supercritical fluid to remove contaminants (hydrocarbons) from an aqueous stream and later separates the supercritical fluid from the contaminants in the same manner as appellant, by pressure release. The method of separation is well-known in the art of supercritical solvents and is certainly not novel" (answer, page 8).

This argument is not well taken because the question is not whether Pujado's separation by pressure release is the same as that of appellant, but whether the applied prior art would have

motivated one of ordinary skill in the art to use Pujado's separation in combination with the teachings of Jackson and Burgess such that appellant's claimed apparatus and method are produced. The examiner has not explained why one of ordinary skill in the art would have had such a motivation.

For the above reasons, we conclude that the examiner has not carried his burden of establishing a *prima facie* case of obviousness of appellant's claimed invention.

DECISION

The rejection of claims 1-15 under 35 U.S.C. § 103 as being unpatentable over Jackson in view of Burgess and Pujado is reversed.

REVERSED

Appeal No. 95-0339
Application 07/881,941

IAN A. CALVERT Administrative Patent Judge	)	
JERRY SMITH Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
TERRY J. OWENS Administrative Patent Judge	)	

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APPENDIX

1. A system for detecting the presence of contaminants in supercritical fluid, said system comprising:

a processing vessel which contains supercritical fluid;

sampling means for removing at least a portion of super-critical fluid from said processing vessel and introducing said portion as a sample stream of supercritical fluid into a vessel having walls defining a contaminant measurement zone;

pressure releasing means for maintaining the pressure within said measurement zone at or below the level required to convert said sample stream into a gas wherein said contaminants present in said sample stream remain in a non-gaseous form;

an attenuated total reflectance plate having an exterior surface located within said measurement zone wherein said non-

gaseous contaminants deposit on said exterior surface, said attenuated total reflectance plate having an electromagnetic radiation inlet and an electromagnetic radiation outlet;

means for introducing electromagnetic radiation into said attenuated total reflectance plate at said inlet wherein said radiation introduced into said plate remains within said plate, but interacts with said contaminants present on said exterior surface of said plate to produce altered electromagnetic radiation which exits said plate at said outlet; and

means for detecting said altered electromagnetic radiation as it exits said attenuated total reflectance plate at said outlet to thereby provide real-time detection of said contaminants present in said supercritical fluid.

9. A method for detecting the presence of contaminants in supercritical fluid comprising the steps of:

providing a processing vessel which contains supercritical fluid;

removing at least a portion of supercritical fluid from said processing vessel and introducing said portion of supercritical fluid into a contaminant measurement zone as a sample stream;

maintaining the pressure within said measurement zone at or below the level required to convert said sample stream into a gas wherein contaminants present in said sample stream remain in a non-gaseous form;

using an attenuated total reflectance plate to spectro-photometrically detect the presence of said non-gaseous contaminants which are deposited on the exterior surface of said plate to thereby provide for real-time detection of said contaminants present in said supercritical fluid.